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Seeking and sharing information dialogically: a conversation analytic study of asynchronous online talk

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Introduction

The forums of social media such as Question and Answer services and online discussion groups enable a new type of interaction between information seekers and information providers. More specifically, these forums exemplify sites of dialogical information interaction which is based on written discourse. Distinct from spoken conversation, discourse of this type can be approached in terms of *online talk* - a novel term advocated by researchers interested in the conversational and dialogical features of computer-mediated communication (Paulus, Warren and Lester, 2016).

Recently, there is a growing interest in the phenomena of information interaction in studies on information searching and retrieval (Fidel, 2012; White, 2016). Along with the breakthrough of the Internet, *interactive* has become a pervasive qualifier of information systems; therefore, almost all information searching and retrieval is nowadays interactive in nature (Ruthven, 2008, p. 45). So far, there is no consensus among researchers about the nature of information interaction. The topics of studies examining interaction of this kind vary widely, ranging from dialogue between the refence librarian and the client to query reformulation performed by the end user. Despite the variety of topics, many of these studies suggest that the question about the fundamental nature of information interaction boils down to dialogue occurring between human actor(s) and information system (Savolainen, 2018).

Unfortunately, so far, there is a dearth of in-depth studies examining dialogue as a constituent of information interaction. The present study was inspired by the need for filling research gaps in this field by examining the nature of dialogue in one of the main domains of information interaction, that is, information seeking and sharing. To sharpen the research focus, the study was concentrated on dialogue-based information seeking and information sharing occurring in asynchronous online discussion forums. Dialogical information seeking and sharing of this kind was approached as a form of online talk (Giles *et al*., 2015). It was scrutinized by means of conversation analysis (CA) because this method enables a micro-level examination of dialogue occurring in conversation. To this end, an attempt was made to specify the nature of asynchronous online talk by scrutinizing question - answer adjacency pairs constitutive of information seeking and sharing. This issue was examined in an explorative empirical study by analysing discussion threads downloaded from an online forum where people seek and share information about do-it-yourself projects. The study departs from the assumption that online talk relevant to information seeking is constituted by the questions posed by the participants, while responses offered to such questions represent information sharing. Dialogue occurs when questions are responded, potentially giving rise to additional questions and answers. In the present study, dialogue of this kind is examined by making use of one of the key constructs of CA, that is, adjacency pair (Schegloff, 2007) More specifically,

the attention will be devoted question - answer(s) adjacency pairs constitutive of asynchronous online talk.

The rest of the article is structured as follows. First, to provide background, the concepts of dialogue and online talk are characterized, followed by the introductory review of CA. Thereafter, the conceptual framework is specified, followed by the description of the empirical research setting and the communication of the findings. The last chapters discuss the research findings and draw conclusions about their significance to research on information interaction.

Literature review

Approaches to dialogue and asynchronous online talk

As a fundamental constituent of human interaction, *dialogue* is a subject to diverse definitions. According to Booth (1989, p. 46), dialogue may be generally understood as "the exchange of symbols between two or more parties, as well as being the meanings that the participants in the communicative process assign to these symbols". Markova and Linell (1996, p. 353) proposed a more detailed definition by characterizing human dialogue as "an interaction between two or more co-present participants using a system of signs", while dialogical interactions are "such discursive processes and their products that are conceptualized as joint, coordinated and mutually interdependent activities of both (all) participants".

Many of the classic studies of human dialogue focus on spoken (face-to-face) conversation between two individuals. Portraying arguments in a dialogue framework, in which two parties engage in an exchange of orderly questions and replies, is an old idea in philosophy, perhaps best known through the dialogues written by Plato to represent the philosophical activities of Socrates (Walton, 2000, p. 328). On the other hand, classic studies on dialogue have mainly approached it from the perspective of the speaker. For example, Austin´s (1962) speech act theory is primarily interested in how the speaker "can do things with words", rather than how the hearer reacts to the utterances generated by the speaker.

The limitations of traditional approaches to dialogue as a face-to-face conversation between two speech partners have become even more evident in studies on computer-mediated communication (CMC). This is because online discussions are often characterized by the complexity of multivocal and sometimes chaotic exchanges between the participants (Marcoccia, 2004). According to Herring and Androutsopoulos (2015, p. 127), computer-mediated discourse (CMD) can be defined as the "communication produced when human beings interact with one another by transmitting messages via networked computers". To emphasize the dialogical aspect of CMC occurring in asynchronous online forums such as discussion groups, the present study prefers the term *online talk* (Paulus, Warren and Lester, 2016). CMD is a narrower construct than online talk because the former suggests that the dialogical information interaction would be confined to communication occurring via networked computers. However, information is increasingly sought and shared in online forums by using mobile phones, too. Moreover, the term online talk is more hospitable to the view that dialogue occurring in online forums is not confined to one-way transmission of messages; instead, dialogue is based on the exchange of symbols between two or more parties, as emphasized in the above definition of dialogue proposed by Booth (1989, p. 46).

Dialogue constitutive of asynchronous online talk occurs in discussion threads, comprised of posts (or messages) written by the participants of online conversation. The message submitted by the thread initiator assigns a topic to the thread to which he or she expects other members to adhere throughout. A thread can contain any number of posts, including multiple posts from the same contributor, even if they are one after the other. Thus, threads document asynchronous dialogue processes constituted by a varying number of consecutive messages. However, such processes tend to be chronologically fragmented because there can be substantial time gaps between the posts

(Ferguson, 2009, pp. 59-60). Conversely, people may post simultaneously, thus disordering the sequence of the exchange.

Conversation analytical approach to dialogue and online talk

Drawing on the ideas of ethnomethodology, CA emerged in the 1960s to address the specifics of social conduct in everyday life. CA was originally developed by Harvey Sacks in collaboration with Emanuel Schegloff and Gail Jefferson. Gradually, CA established a novel paradigm for researching the organization of human action in and through talk in interaction (Clayman and Gill, 2012, p. 120). In early studies, Sacks recorded telephone conversations and identified in them interactional structures. Most importantly, it appeared that individual turns in conversation constitute sequences. If the turns are adjacent, they imply a specific interrelationship and create normative expectations about how to construct the next turn. Turns of this particular kind were referred to as a*djacency pairs* (Schegloff and Sacks, 1973). An adjacency pair is a sequence of conversational turns that are tied to each other in which the former calls forth the latter (Gibson, 2009a). For example, the appropriate reaction to a question is to answer it. The question is treated as *the first pair part* (FPP) of the adjacency pair, while answer is its *second pair part* (SPP) (Schegloff, 2007, pp. 13-14). More precisely, FPPs are utterance types such as question or request which initiate some exchange, while SPPs are utterance types such as answer, reject, and agree or disagree (Schegloff, 2007, pp. 13-14).

As part of their exploitation as a resource for sequence construction, adjacency pair-based sequences can have more than two turns (Schegloff, 2007, p. 14). Therefore, the picture of a single, basic, minimal adjacency pair FPP - SPP should be substantiated by noting that a great many sequences involve expansion of this basic unit. Such expansions involve additional participation by the parties through additional turns, over and above the two which compose the minimal version of the sequence. These expansions can occur in the three possible places which a two-turn unit permits. *Pre-expansions* come before FPP, while *insert expansions* appear between FPP and SPP and *post-expansions* after SPP (Schegloff, 2007, p. 26). Figure 1 depicts the model for sequence organization characteristic of expanded adjacency pairs.

<= Pre-expansion
First pair part (FPP)
<= Insert expansion
Second pair part (SPP)
<= Post-expansion

Figure 1. The model of sequence organization in conversational interaction (Schegloff, 2007, p. 26).

The above model provides a universal matrix for the scrutiny of a sequential course of interaction (Arminen, 2008, p. 572). Importantly, the model not only devotes attention to the one-directional progress of a sequence from FPP to SPP; it also indicates how expansions of diverse types are located in sequence organization.

In general, pre-expansions are preliminaries that project specific imminent FPPs in the form of pre-invitations and pre-requests, for example (Schegloff, 2007, pp. 28-29). Therefore, pre-expansions project the contingent possibility that a base FPP (e.g., a question) will be presented. Insert expansions are utterances which prospective SPP speakers can initiate (Schegloff, 2007, p. 97). In spoken conversation, expansions of this type can focus on either FPP or SPP. In the former case, the insert expansion deals with the problems of understanding of a FPP, while insert expansions focussing on SPP may suggest how it could be elaborated (Schegloff, 2007, pp. 99-100; p. 106). In spoken conversation, typical insert expansions are constituted by repairs. It occurs, for example, when a FPP speaker hastens to correct a wrong word ("sorry, I meant to say …), before a SPP speaker would

respond his or her question. Alternatively, a SPP speaker may request the FPP speaker to clarify his or her initial question before offering an answer. Finally, sequences can be expanded after SPPs by means of post-expansions. They can be minimal or non-minimal, depending on the content of SPPs (Schegloff, 2007, p. 117). SPPs containing preferred answers such as accepting an invitation tend to lead to minimal post-expansions; for example, the FPP speaker briefly thanks the SPP speaker for accepting his or her invitation. Often, post-expansions of this type result in the closure of a sequence, while SPPs with dispreferred answers tend to lead to non-minimal expansions and the continuation of the sequence (Schegloff, 2007, pp. 149-151). For instance, the SPP speaker can provide a detailed explanation for declining an invitation. Non-minimal post-expansion may also occur when the participants of conversation begin to debate a sensitive issue articulated in a SPP.

Since the 1970s, researchers applying CA have generated a substantial body of empirical findings. So far, most studies have made use of data drawn from spoken conversation, with the intent of examining practices such as turn-taking and the repair of misunderstandings in real-life interactions (Mazeland, 2006, p. 153). Hypothetical examples examined in experimental settings are avoided because research has demonstrated that such data tend to yield oversimplified and misleading representations of interactional processes (Clayman and Gill, 2012, p. 121). Although the foundational work in CA concentrates on spoken discussion, CA has gradually been extended to research on online talk (Giles *et al*., 2015). Meredith and Potter (2013, p. 374) argued that "electronic discourse should be seen as electronic interaction" and, as such, requires a method such as CA to understand it. So far, however, the ideas of CA have been used relatively seldom in studies examining online talk constitutive of communication, information seeking and information sharing. Nevertheless, there are a few examples of research of this type since the early 2000s. Reed (2001) explored sequential integrity and the local management of interaction on an Internet newsgroup. Somewhat later, Antaki and associates (2005) applied CA to examine how a user, in carrying off a 'declaration of love,' attends to her accountability in posting such a message. Interestingly, as one of the first CA treatments of an online discussion thread, the above investigation was confined to the scrutiny of the first two posts.

Later CA studies have enriched the picture of online talk by examining diverse issues such as intercultural communication online (Gibson, 2009a), the organization of asynchronous discourse in a postgraduate reading group (Gibson, 2009b), the nature of problem presentation and responses on an asynchronous online forum for young people who self-harm (Smithson *et al*., 2011), and problems faced in library chat reference interactions (Koshik and Okazawa, 2012). More recently, Steensen (2014) combined the ideas of CA and content analysis in a study scrutinizing conversations occurring in an interactive live blog. The findings revealed that there are many more SPP turns than FPP turns, thus suggesting that a question can yield several answers.

Empirical studies such as these have revealed that the move from a 'digitized' application of traditional CA to a customized version of CA - a kind of *digital conversation analysis* for specific use with online interaction - requires the reworking of the tenets of CA (Giles *et al*., 2015, p. 47). The motivation behind such an endeavour is well-founded because the application of CA in the study of online talk holds a remarkable potential. Online talk being in digitised written form means that many online exchanges are stored in an easily accessible archive. This resource allows interactants to refer to previous exchanges in a way that would be impossible in spoken dialogue, often by copying and pasting archived material, some of which may be retrieved from several years (Giles *et al*., 2015, p. 48). Archived nature of threads has a profound impact on the online discussion because the participants can refer explicitly to previous turns without relying on others' memory and to cite from prior messages posted to the threads on the same forum. As Giles and associates (2015, p. 48) aptly point out, the quoting and referencing of earlier messages, images, and other forms of content, whether through replication or hyperlink, has become "the sine qua non of Web 2.0 interaction".

On the other hand, the application of CA to the study of online talk is not without problems. In online talk, question-answer pairs which appear on the posting board are not necessarily adjacency pairs in the sense of spoken conversation. To examine this phenomenon, Garcia and Jacobs (1998, p. 305) introduced the term *phantom adjacency pair*. A message which seems to offer a response to the question presented in the preceding post may, in fact, have been written with the intent of responding another question posed earlier in the conversation. According to Herring (1999), *disrupted adjacency* of this kind may render it difficult for the users to track sequential exchanges, and interaction may become fragmented as a result. Moreover, there is not necessarily a one-to-one correspondence between a question an answer because multiple responses are often directed at a single initiating message. Conversely, single messages may respond to more than one initiating message, especially in asynchronous discussion. Thus, violations of sequential coherence tend to be the rule rather than the exception in online talk because adjacency pairs are often disrupted by intervening messages.

Nevertheless, despite of phantom or disrupted adjacency, empirical studies have demonstrated that the participants of online discussion can sufficiently orient themselves to previous messages within the conversation. According to Schönfeldt and Golato (2003, 251), this is enabled by the construction of *virtual adjacency*. The participants construct it while reading prior messages and relating them in a meaningful way. Thus, adjacency of this type is an achievement of the participants' reading of, and selection from, a stream of messages addressed to them. Thereby, virtual adjacency is not merely a construct on the part of the analysts but a true reading on the part of the participants.

Conceptual framework and research questions

To investigate the potential of CA in the study of online talk, Schegloff´s (2007) model of sequence organization depicted in Figure 1 above was taken as a point of departure. Because online talk constitutive of information seeking and sharing can be best approached in terms of questions presented and answers offered by the participants of online discussion, the analysis of FPPs and SPPs was confined to the scrutiny of question - answer adjacency pairs.

To elaborate Schegloff´s (2007) CA model for the needs of the present study, a number of specifications were made. First, SPP was divided into two subcategories by drawing on the taxonomy of question and answer types developed by Stivers and Enfield (2010). *Answer* was defined as an utterance which directly deals with the question as put. More precisely, an answer provides information relevant to the issue at hand; the answer may be in the form of fact, advice or personal opinion. In contrast, *non-answer response* is an utterance that fails to directly answer the question as put. Responses of this type may include utterances such as "I don't know" and "your question is meaningless". At the early stage of the study, the above taxonomy proposed by Stivers and Enfield (2010) was also used to specify the nature of FPPs, that is, questions. However, the preliminary analysis of the empirical data revealed that subcategories such as polar question, alternative question, content question and rhetorical question do not differentiate the ways in which the participants formulated their answers. Therefore, the category of question was approached in a generic way, without dividing it into subcategories.

Second, the constructs of pre-expansion, insert expansion and post-expansion were elaborated for the needs of the present study. More specifically, the refined categorization of expansions of diverse types was developed by drawing on the preliminary analysis of the empirical data. On this basis, the category of pre-expansion was refined by identifying two sub-categories, that is, *introduction* and *pre-invitation*. Similar to spoken conversation, insert expansion may focus in online talk on FPP or SPP (Schegloff 2007, pp. 99-100). However, it is a key characteristic of asynchronous online talk that insert expansion manifests itself in the form of *quotes* repeating messages (or their portions) constitutive of questions or prior answers Finally, the category of post-

expansion was specified by identifying four sub-categories: *acknowledgement* which stands for a minimal post-expansion. Non-minimal post-expansion is represented by three subcategories: *broadening the topic*, *specifying the answer*, and *challenging the answer*. The conceptual framework built on the above categories is presented in Figure 2 below.

<= Pre-expansion

- *Introduction* (INT): the thread initiator provides background for a forthcoming question presented in FPP by characterizing the nature of the issue at hand, the context of the problem faced, and personal experiences received while attempting to solve the problem, for example.
- *Pre-invitation* (PREI): the thread initiator welcomes potential contributions from fellow participants.

First pair part (FPP)

- *Question* (Q): the thread initiator or another participant presents a question in the form of interrogative sentence(s).

<= Insert expansion

- *Quote* (QUO): the participant repeats a prior message or part of it in order to put his or her answer in a meaningful context.

Second pair part (SPP)

- *Answer* (A): the participant offers a distinct (non-repetitive) response to the question presented in FPP.
- *Non-answer response* (NAR): the participant offers a response that fails to answer the question presented in FPP.

<= Post-expansion

- *Acknowledgement* (ACK): the participant values an answer offered in SPP.
- *Broadening the topic* (BRO): the participant comments on an answer offered in SPP by introducing a novel viewpoint.
- *Specifying the answer* (SPE): the participant refines an answer offered in SPP by providing further details.
- *Challenging the answer* (CHA): the participant questions the relevance of an answer offered in SPP.

Figure 2. The categories constituting asynchronous online talk relevant to information seeking and sharing.

The study departed from the assumption that asynchronous online talk is constituted by various constellations of the ten categories specified in Figure 2. Minimally, there is a base adjacency pair, i.e., FPP (Question) => SPP (Answer). However, dialogue-based information seeking and sharing seldom occur within a base pair; there can be numerous combinations of the categories forming expanded adjacency pairs with pre-, insert and post-expansions. For instance, a question presented by the thread initiator may incorporate a pre-invitation encouraging the fellow participants to contribute. Moreover, a question (FPP) may trigger a number of distinct answers (SPP) incorporating quotes from prior responses, as well as messages broadening the discussion topic or specifying an existing response, for example.

Given the exploratory nature of the present investigation, no attempts were made to identify the wide variety of category combinations constituting online talk. Instead, drawing on the preliminary analysis of the empirical data, the attention was devoted to four key patterns suggested by the conceptual framework depicted in Figure 2 above, that is

- Question – Answers adjacency pair with pre- and insert expansions
- Question – Answers adjacency pair with pre- and insert expansions plus post-expansion of the type of specifying the answer
- Question – Answers adjacency pair with pre- and insert expansions plus post-expansion of the type of broadening the topic
- Question – Answers adjacency pair with pre- and insert expansions plus post-expansion of the type of challenging the answer.

The first-mentioned pattern is most simple because the expanded adjacency pair only incorporates pre- and insert expansions. Three other patterns are more complicated because they also incorporate post-expansions of diverse types. To examine the above issues in greater depth, the present study addresses the following research questions:

- RQ1. How are the categories constitutive of asynchronous online talk distributed in the context of dialogical information seeking and sharing occurring in a discussion forum?
- RQ2. Within diverse patterns of asynchronous online talk structured by expanded adjacency pairs, how is information sought and shared dialogically?

Answer to the first research question provides an indicative quantitative picture of the nature of asynchronous online talk, thereby providing background for the qualitative CA. The second research question focusses on the core issue of the present study, that is, the ways in which information seeking and sharing occur dialogically in asynchronous online talk.

Empirical data and analysis

Conversation analytic methodology is strongly data driven. Typically, the researcher scrutinizes interaction in a single episode with respect to some relevant aspect (Mazeland, 2006, p. 159). The scrutiny of asynchronous online talk occurring in discussion threads exemplifies well analysis of this kind. The research questions specified above were examined in an explorative study by focussing on a discussion group interested in do-it-yourself (DIY) projects. The empirical data were gathered from *uk.d-i-y* (https://groups.google.com/forum/#!forum/uk.d-i-y). It is one of the online forums of Google Groups - a service that provides discussion groups for people sharing common interests. At the time of the data gathering in March 2018, the DIY Group provided a huge information resource with over 123 000 discussion threads. The discussion topics varied widely, ranging from floor lamination to politically sensitive issues such as immigration. The above group was chosen for the empirical analysis because DIY is an increasingly popular consumer behaviour associated with active information seeking and sharing about products on sale, as well as their qualities and prices (Wolf, 2011). People who undertake DIY projects (DIYers) choose among available materials and tools, engineer the work process to complete the project, and act as inspectors and evaluators when deciding whether the product has achieved the desired value. DIYers compare the expected economic value with the purchase of a marketplace option for similar goods and services to assess the relative economic benefits of DIY projects. To this end, social media forums such as discussion groups provide easily accessible ways to seek information and share experiences.

To examine the nature of asynchronous dialogue process among the DIY Group participants, a sample of 20 most recent threads with 10 - 30 posts was taken in March 2018. The lower threshold of 10 posts was chosen to guarantee a sufficient amount messages exhibiting dialogue; the preliminary examination of the empirical material revealed that shorter threads tend to fail this requirement. To exclude overly long threads, the upper threshold was set to 30 messages. By

this criterion, altogether 329 posts were downloaded from the DIY forum; the oldest thread was created on 23 February 2018 and the most recent on 6 March 2018. Because CA focussed on micro-analysis of asynchronous discussion, the sample was intentionally confined to a small number of threads. Nevertheless, the sample appeared to be sufficient for the needs of an exploratory study because the material enabled an indicative quantitative picture of the distribution of the categories constitutive of online talk. More importantly, however, the material enabled a detailed qualitative analysis of online talk occurring in the above forum.

Different from traditional CA scrutinizing individual sentences, one at a time, a more contextualized approach was adopted by taking a post as a unit of analysis. The analysis was preceded by careful reading of the downloaded material in order to obtain an overview of the nature of dialogue occurring in the discussion threads. Thereafter, the data was coded by making use of the ten categories specified in Figure 2 above. To achieve this, individual sentences or text paragraphs forming a message were equipped with appropriate codes representing categories such as introduction (INT), answer (A), question (Q), quote (QUO), specifying the answer (SPE) and broadening the topic (BRO). In the coding of individual messages, multiple codes were used to capture the nuances of dialogue constitutive of online talk. The preliminary coding was refined iteratively by checking the appropriateness of individual codes. The codes assigned to text passages enabled an exact identification of the FPPs and SPPs, as well as the elements of pre-, insert and post-expansions. Because the study is explorative in nature and does not aim at statistically representative generalizations of the distribution of categories constitutive of online talk, the requirement of the consensus on coding decisions based on interrater reliability can be compromised without endangering the reliability of the exploratory study. According to Miles and Huberman (1994, p. 64), check-coding the same data is useful for the lone researcher, provided that code–recode consistencies are at least 90%. Following this guideline, check-coding was repeated, and the initial coding was carefully refined until there were no anomalies.

As noted above, the analysis of online discussions is often rendered difficult due to the disrupted adjacency because there is not necessarily a one-to-one correspondence between a question and an answer (Herring, 1999). In the present investigation, the problem of disrupted adjacency was avoided by means of a careful coding indicating the FPPs and SPPs. Earlier studies have also reported methodological problems in cases in which the second poster addresses the forum with a message that is entirely unrelated to the question proposed by the thread initiator, that is, FPP (Giles *et al*., 2015, p. 49). In this case, it is not until a post specifically addresses the initial question that we are able to see the second half (SPP) of the adjacency pair. In the present study, unrelated messages such as these were coded as non-answer responses constitutive of the question - answers setting. However, to track relevant answers to the initial question (or additional questions constitutive of other FPPs), the methodological idea of "reading path" was followed (ten Have, 1999). To track relevant answers (SPPs), the thread was read meticulously in order to identify the posts offering theme-specific answers to question presented in FPP particularly in cases in which the adjacency pair was intervened by messages constitutive of another adjacency pair. This idea appeared to be particularly useful in the coding of long threads with multiple FPPs and diverse SPPs dispersed within long threads with 20+ posts.

To answer the first research question dealing with frequency of the categories constitutive of online talk, the data were scrutinized by means of descriptive statistics. Thereafter, to answer the second research question, qualitative CA was conducted. To achieve this, coded text portions exhibiting the four key patterns of online talk were scrutinized. First, the base adjacency pair constituted by the initial question and first answer was identified from a thread, followed by the scrutiny of other coded text portions containing additional responses to the initial question plus elements of pre-, insert and post-expansion. Second, other adjacency pairs within the same thread were identified. A similar analysis was repeated in all threads. Finally and most importantly, qualitative CA was conducted by scrutinizing how information is sought and shared dialogically

within such patterns. More precisely, attention was devoted to how the participants articulate questions in order to invite answers from potential contributors and how the fellow participants reflectively respond such questions by offering answers in light of prior discussion. To sum up: the main idea of CA was to specify how the dialogue between questions and answer differs within diverse patterns of online talk.

Because the DIY Group contributors are expected to be well aware of the fact that their messages will become publicly available on this site, no attempts were made to contact the participants to obtain permission for the use of their messages in the present study. Asking permission would have been difficult in practice because the majority of the contributors appeared to be occasional users; they may not be motivated in answering for requests such as these. However, when using the illustrative extracts taken from messages, the anonymity of the contributors is carefully protected. Their nicknames are replaced by neutral identifiers such as Participant A and Participant B. Given the high number of discussion threads focussing on the issues of DIY, it is unlikely that such extracts could be associated with an individual contributor.

Empirical findings

Quantitative overview

There were 86 participants posting altogether 329 messages to the DIY forum, that is, 16 messages per thread on average and 4 messages per participant. The most active participant wrote no less than 21 messages; on the other hand, 52 participants, that is, about 60% of all contributors posted only one or two messages. Overall, the discussion was dominated by a dozen of frequent contributors. From the 20 threads, altogether 102 question - answers adjacency pairs were identified; the number of such pairs per thread varied considerably, ranging from 1 to 13. As specified in Figure 2 above, altogether 10 categories of online talk were used in the coding. The total number of coded units was 992, that is, there were altogether 992 instances of the use of diverse categories. The distribution of the categories is presented in Table I.

Quote	48.3
Answer	15.8
Specifying the answer	15.7
Question	10.3
Introduction	3.5
Challenging the answer	2.7
Acknowledgement	1.5
Non-answer response	1.2
Broadening the topic	0.5
Pre-invitation	0.5
Total	100.0

Table I. The percentage distribution of the categories constitutive of asynchronous online talk (n = 992).

As Table I demonstrates, the distribution of the categories was uneven in that the share of quotes was no less than 48.3%. Answer was quite a frequent category, too, comprising 15.8% of the codes assigned to the empirical data, followed by specifying the answer (15.7%) and question (10.3%). In comparison, the share of other categories, that is, Introduction, Challenging the answer, Non-answer response, Broadening the topic and Pre-invitation remained quite marginal.

Looking at the distribution from the viewpoint of the expanded adjacency pairs, the share of categories constitutive of pre-expansion, that is, Introduction and Pre-invitation was 4%. In terms of quantity, the major role was occupied by insert expansion due to the high number of quotes. Finally, the share of categories constitutive of post-expansion, that is, Acknowledgement, Broadening the topic, Challenging the answer, and Specifying the answer amounted to about 20%. This suggests the share of text portions constitutive of unexpanded adjacency pair FPP (question) and SPP (answers) is quite secondary because their percentage shares were only 10% and 17%. Similarly, the share of the elements constitutive of pre-expansion was fairly marginal (4%), while insert expansion covers a substantial part of the coded material (about 48%). In terms of quantity, the role of post-expansion is less visible (20%), even though the text portions specifying or challenging the answers and broadening the discussion topic may be seen far more interesting than quotes merely repeating what is said before.

The patterns of asynchronous online talk

The qualitative findings of CA will be reported by reviewing four main patterns of asynchronous online talk relevant to information seeking and sharing in the DIY group. First, the pattern of answering the question will be scrutinized, followed by the patterns of specifying the answer, broadening the topic and challenging the answer. For clarity, the illustrative extracts will be equipped with the codes of categories specified in Figure 2 above. In case of multiple instances of the same category, they will be specified as Q-1 and Q-2 for questions 1 and 2 constitutive of the FPP, while answers 1 and 2 constituting the SPP will be referred to as A-1 and A-2, for example. For space restrictions, only one illustrative extract per pattern will be scrutinized to characterize the main features of asynchronous online talk. For the same reason, the nature of categories specified in Figure 2 above will be examined selectively. In the illustrative extracts, no attention is devoted to pre-invitations, non-response answers and acknowledgements. They were excluded due to their marginal role; as Table I above indicates, their common share of the coded categories was only 3.2%.

Answering the question

The embryonic form of adjacency pair is FPP - SPP formed by a single question and a single answer offered to it. In asynchronous online discussion, however, the threads are seldom confined to base adjacency pairs of this kind. A question tends to trigger more than one response, and distinct answers may appear in consecutive messages written by different authors. The following extract illustrates an expanded adjacency pair in which the SPP is constituted by multiple responses incorporating insert expansions. In a thread containing 17 messages, the participants discussed the choice of vacuum cleaner. For the space restrictions, only the four first messages are scrutinized to illustrate how information is dialogically sought and shared in online talk.

Extract 1. Vacuum cleaner recommendation (Thread 18).

Message 1. Thread initiator (TI).

Looking for a mains-powered cylinder vac. Don't mind if it's expensive. (INT) *Anyone care to make a recommendation?* (Q-1)

Message 2. Participant A.

TI wrote:

> Looking for a mains-powered cylinder vac. Don't mind if it's expensive. Anyone care to make a >recommendation? (QUO)

Henry. Or Miele if you have money to burn. (A-1)

Message 3. Participant B.

TI wrote:
>Looking for a mains-powered cylinder vac. Don't mind if it's expensive. Anyone care to make a >recommendation? (QUO)

Bosch gas25 or bigger. (A-2*)*

Message 4. Participant C.

TI wrote:
> Looking for a mains-powered cylinder vac. Don't mind if it's expensive. Anyone care to make a >recommendation? (QUO)
Participant A wrote:
> Henry. (QUO)

I have a George. George still has the more powerful motor that's now been scaled down in the Henry model because George is a wet and dry machine and the new regulations don't apply. I never realised how useful the wet operation could be until I really needed it one day. It's worth having the dual function even if you only use it occasionally IMO (= in my opinion). (A-3)

The above dialogue exemplifies a basic form of asynchronous online talk relevant to information seeking and sharing. The thread initiator first introduces his or her forthcoming question, thus preparing the FPP formulated as "Anyone care to make a recommendation?" Three distinct responses are structured typical to asynchronous discussion thread. The responses are preceded by an insert expansion, that is, quote(s) of the initial message or the answer provided by a prior participant. In this case, the structure of the expanded adjacency pair is simple: Pre-expansion (INT) => FPP (Q) => insert expansion (QUO) => SPP (A-1, A-2, A-3). In patterns such as these, there are no intervening questions forming another FPPs within an existing adjacency pair, or elements of post-expansion such as specifying the answer. In this respect, Extract 1 resembles a face-to-face discussion in which an individual welcomes comments about the choice of a vacuum cleaner and his or her friends then indicate their opinions, one after another. However, the nature of insert expansions is different in spoken conversation. It is unlikely that the participants would first repeat word-for-word the questions or answers uttered by prior speakers before providing responses.

Specifying the answer

The patterns of asynchronous online talk become more complicated when non-minimal post-expansions are incorporated in the adjacency pairs. As Table I above indicated, specifying the answer appeared to be the most frequent type of post-expansion. Extract 2 illustrates the case in which dialogical information seeking and sharing is deepened by refining the existing answers. One of the DIY threads discussed the problems of finding a matching car paint. This thread contained 17 messages; of them, the initial post presented a question, followed a series of messages specifying the answers offered during the discussion. In Extract 2, due to space restrictions, only three messages out of eight posts specifying the answers are included. The pattern of online talk is more complicated

compared to Extract 1 because the adjacency pair incorporates post-expansion. Figure 3 illustrates the pattern analysed in Extract 2.

Take Figure 3 about here.

Figure 3. An example of an adjacency pair incorporating non-minimal post-expansion.

Extract 2. Matching car paint (Thread 7).

Message 1. Thread initiator (TI).

Has anyone ever ordered paint for their car solely from the paint code number you find on a little plate somewhere on the car's body? Any experiences? (Q-1)

Message 2. Participant A.

TI wrote:
>Has anyone ever ordered paint for their car solely from the paint code number you find on a little >plate somewhere on the car's body. Any experiences? (QUO)

I've done it a couple of times with some misgivings but the outlay on a small bottle of touch-up paint wasn't so large. The colour I got was pretty much identical with the original, but on a vehicle that's a few years old the paint might have faded a tiny bit, so I didn't mind it not being absolutely identical. For my purposes, touching up a small fairly inconspicuous area, it worked fine. (A-1)

Message 3. Participant B.

TI wrote:
>Has anyone ever ordered paint for their car solely from the paint code number you find on a little >plate somewhere on the car's body? Any experiences? (QUO)

I've done that from https://www.paints4u.com/ and it has always been a good match. (A-2)

Message 4. Participant C.

TI wrote:
>Has anyone ever ordered paint for their car solely from the paint code number you find on a little >plate somewhere on the car's body? Any experiences? (QUO)

Forget it for red cars. Red fades terribly. (A-3)

(messages 5-7 by participants D, E and F providing answers A-4, A-5 and A-6 are omitted)

Message 8. Participant G.

Participant C wrote:
> Forget it for red cars. Red fades terribly. (QUO)

Not so much with a clear lacquer on top. (SPE-1)

Message 9. Participant H.

Participant H wrote:
>Not so much with a clear lacquer on top. (QUO)

Until it peels. (SPE-2)

Message 10. Participant I.

Participant H wrote:
> Not so much with a clear lacquer on top. (QUO)
Participant I wrote:
> Until it peels. (QUO)

My 2001 red Ford has one small area of around 4 inch by 1 inch where the lacquer started to peel last year. A light rub down around the edges and an application of lacquer with a small brush has consolidated the peeling. (SPE-3)

Similar to Extract 1 reviewed above, the FPP is constituted by the question presented by the thread initiator. In fact, the FPP contains two interrogatives: (i) “Has anyone ever ordered paint for their car solely from the paint code number you find on a little plate somewhere on the car's body?” and (ii) “Any experiences?” Because the latter request is not meaningful as a separate utterance, the interrogatives are interpreted as constituents of the same question. Thereafter, the SPP is constructed by offering distinct (non-repetitive) answers to this question (messages 2-7). Again, insert expansion is constituted by the quotes repeating the initial question. Occasionally, different from Extract 1, the initial message contained no pre-expansion in Extract 2. However, elements such Introduction and Pre-invitation can precede the FPP in the latter pattern as well.

In Extract 2, post-expansion of the expanded adjacency pair begins in message 8 in which participant G first repeats the response provided by participant C: “Forget it for red cars. Red fades terribly”. Here comes a particular characteristic of asynchronous online talk because quote as an instance of insert expansion is placed between the last answer (A-7) constitutive of the SPP and the first element of post-expansion. Therefore, different from spoken conversation, insert expansion can also appear within the sequence which forms the post-expansion. In Extract 2, answer 3 is specified by pointing out that the nature of lacquering affects the way in which the red colour may fade. Different from the answers A-2 - A-6 responding the initial question, the specification of the answers occurs when a response first repeats a prior answer, for example, answer 3 quoted by participant G in message 8. The quote is followed by utterances refining a prior answer by introducing new details, thus helping to understand deeper the issue at hand. In Extract 2, participants H and I add further details to the fading issue, thus gradually specifying the picture about finding a matching car paint.

Broadening the topic

Opposite to the above pattern in which existing answers are specified, the attempts to seek and share information may also result in the broadening of the discussion topic when the participants introduce novel viewpoints. Similar to the pattern of specifying the answer, the broadening of discussion topic takes place within the post-expansion. Extract 3 illustrates the nature of this pattern.

Extract 3. Neff oven cuts out (Thread 8).

Message 1. Thread initiator (TI).

Father-in-law has a Neff oven. I replaced the heating element a year or so ago and all has been well since. Now he tells me that when he turns the oven on, it heats up but cuts out and won't heat up again until cold. So, it cycles cold-hot-cold, etc. My theory is that the thermocouple is faulty (always on) and there is an over temperature cut-out that kicks in when it gets hot. (INT)

Would this sound the likely cause? (Q-1) *If so, is there a way to test this?* (Q-2) *I guess I could set the oven to a low temp and then see if it heats up to max. Or is there another likely cause?* (Q-3)

Message 2. Participant A.

TI wrote:
>Father-in-law has a Neff oven. I replaced the heating element a year or so ago and all has been >well since. Now he tells me that when he turns the oven on, it heats up but cuts out and won't heat >up again until cold. So, it cycles cold-hot-cold, etc. My theory is that the thermocouple is faulty >(always on) and there is an over temperature cut-out that kicks in when it gets hot. (QUO)

Stick a thermometer in it & observe. (A-1)

Message 3. Participant B.

Many of these seem to have module death. (A-2) I hate modern appliances, it was so simple in the good old days. (BRO-1)

Message 4. Participant C.

Participant B wrote:
>I hate modern appliances, it was so simple in the good old days. (QUO)

Tell me about it. I drove to Glasgow and back yesterday, 130 miles each way, and during the journey, wanted to fiddle with the radio and the heater controls while driving. Utterly impossible without taking eyes from the road, yet in days of old when heaters had dials and levers connected to cables, everything could be done by feel. Same with the radio - turn one knob to adjust the volume, the other to tune. Simple. Now, push buttons with menus. Progress? (BRO-2)

In Extract 3, the forthcoming FPP is prepared by introducing the problems faced with the heating element of a newly purchased oven. The thread initiator speculates the reason of the problem and then presents three questions to potential answerers. Different from Extract 2 discussed above, questions 1, 2 and 3 deal with different though closely related issues, thus potentially triggering theme-specific responses. Response(s) to question 1 forms an adjacency pair, while answer(s) to questions 2 and 3 constitute two additional adjacency pairs within the discussion thread. In Extract 3, the SPP is constituted by answers A-1 and A-2 offered in messages 2 and 3. Of them, answer 1 ("Stick a thermometer in it & observe") - preceded by the quote of the introductory sentences - responds to question 2 dealing with the testing of the thermocouple. In turn, answer 2 offered by Participant B ("Many of these seem to have module death") can be interpreted as a comment on question 1 speculating the cause of the deterioration of the thermocouple, thus forming the SPP of the second adjacency pair.

Post-expansion of the latter adjacency pair begins in message 3 where participant B broadens the discussion topic by introducing a novel viewpoint, that is, his or her aversion towards

"modern appliances" in general. Post-expansion of this type is contextualized in answer 2. The discussion of the new topic continues when Participant C introduces an additional viewpoint to the "aversion" issue by reporting his or her experience about the usability of a car radio interface. In fact, the usability issue can be interpreted a sub-topic which is no longer directly related to the initial questions posed by the thread initiator. This suggests that post-expansion of this type may detract the discussion. In Extract 3, the message written by participant C ends with a rhetorical question, that is, "progress?" From the viewpoint of question - adjacency pairs, such expressions are subject to multiple interpretations. If the rhetorical question is responded in a subsequent message, it forms a new FPP. Otherwise, as in Extract 3, it may be interpreted as an integral element of the utterance forming post-expansion of an existing adjacency pair.

Challenging the answer

Finally, post-expansion can appear in cases in which the relevance of prior answers is questioned. Similar to the other types of post-expansion, utterances challenging an existing answer may take place when one or more distinct responses are first offered to the question forming the FPP. Extract 4 illustrates the case in which the responses offered by fellow contributors are challenged in discussion. The participants attempted to find ways to prevent pipes freezing during an exceptionally hard freeze experienced in Britain in March 2018. The thread initiator presented no explicit question; instead he or she advised to leave a tap dripping to minimize the risk of freezing pipes. The above suggestion triggered an additional comment in message 2 by participant A reporting that he or she had followed the above advice "by accident". As introductory notions, the initial messages function as pre-expansion, triggering the question constitutive of the FPP in message 3.

Extract 4. Freezing pipes (Thread 6).

Message 3. Participant B.

TI wrote:
>If you think your pipes might freeze, leave a tap dripping. The one furthest from the stop tap. (QUO)

More Viz top tips? (Q-1)

Message 4. Participant C.

TI wrote:
>If you think your pipes might freeze, leave a tap dripping. The one furthest from the stop tap. (QUO)
Participant B wrote:
>More Viz top tips? (QUO)

It won't stop the pipes freezing; the flow rate is too little to do that. In theory, it provides a pressure relief point if they do. It therefore follows that the tap to leave dripping is one at the end of a pipe that is particularly vulnerable to freezing. You also need to hope that the freezing first happens furthest from the tap before progressing towards it. (A-1)

Message 5. TI.

Participant B wrote:
>More Viz top tips? (QUO)
Participant C wrote:

>It won't stop the pipes freezing; the flow rate is too little to do that. In theory, it provides a pressure >relief point if they do. It therefore follows that the tap to leave dripping is one at the end of a pipe >that is particularly vulnerable to freezing. You also need to hope that the freezing first happens >furthest from the tap before progressing towards it. (QUO)

It does stop them freezing providing they are insulated. The water comes out of the ground at around 10 deg C. After a while you know how fast to let it go to prevent freezing. (CHA-1)
Message 6. Participant D.

Participant C wrote:
>It won't stop the pipes freezing; the flow rate is too little to do that. In theory, it provides a pressure >relief point if they do. It therefore follows that the tap to leave dripping is one at the end of a pipe >that is particularly vulnerable to freezing. You also need to hope that the freezing first happens >furthest from the tap before progressing towards it. (QUO)

Think how much energy you are wasting by heating your roof void. (CHA-2)

Message 7. Participant C.

Participant D wrote:
>Think how much energy you are wasting by heating your roof void. (QUO)

You haven't really thought that through, have you? Energy is only wasted when heat transits from the warm interior to a cold exterior. It is irrelevant whether you choose to have that transition point above or below the loft space. In fact, as part of the roof replacement was upgrading the insulation levels, my warm loft loses less heat than the cold loft I had before. (CHA-3)

Message 8. Participant D.

Participant C wrote
>You haven't really thought that through, have you? Energy is only wasted when heat transits from >the warm interior to a cold exterior. It is irrelevant whether you choose to have that transition point >above or below the loft space. (QUO)

It follows that, if your roof space were two miles high, heating it wouldn't waste any more energy than it does now. But that's absurd. So, your remark is absurd. (CHA-4)

In Extract 4, the question constituting the FPP requests more tips to solve the freezing problem. The SPP is constructed in message 4 where participant C offers answer 1. Post-expansion begins in message 5 where the thread initiator challenges the idea offered by participant C, thus potentially giving rise to arguments pro and con. In the following message, participant D also challenges the response provided by participant C, though from a different angle, that is, energy wasting. In messages 7 and 8, the debate is continued about the nature of energy wasting. The critical comment written by participant D in message 8 (“So, your remark is absurd) suggests that the discussion may become more heated because expressions such as these can result in flaming and further distract the discussion from the original topic. Overall, the pattern of challenging the answer is similar to the patterns of specifying the answer and broadening the topic in that the FPP can be preceded by pre-expansion, followed by the SPP with one or more answers incorporating insert expansions. However, different from the above types, post-expansion is constituted by critical utterances questioning the relevance of answer(s) constitutive of SPP.

Discussion

The present investigation refined the picture of dialogical information seeking and sharing by examining the nature of asynchronous online talk structured by question - answers adjacency pairs. The elaboration of Schegloff´s (2007) model for sequence organization enabled the identification of categories relevant to asynchronous online talk. The potential of the novel framework was examined in an exploratory study focussing on online talk occurring in an asynchronous discussion forum.

The study sought answers to two research questions. First, to provide background, it was asked how are the categories constitutive of asynchronous online talk distributed in the context of dialogical information seeking and sharing occurring in a discussion forum? The findings indicate that the share of categories forming the FPP (question) was about 10%, while the share of the SPP (answers and non-response answers) was somewhat higher, that is, 17%. The rest of the categories (83%) represented expansions of various types. The share of categories constituting pre-expansion, that is, introduction and pre-invitation was quite marginal (4%). Utterances quoting prior messages are most frequent elements in online talk (about 48%); in terms of quantity, insert expansions in the form of quotes are most visible constituents of online talk. Finally, the share of categories constitutive of post-expansion, i.e., acknowledgement, broadening the topic, challenging the answer, and specifying the answer amounted to about 20%. Overall, the quantitative findings suggest that dialogical information seeking and sharing confined to base adjacency pairs would be quite limited. Expansions of diverse types occupy an important role in online talk. On the other hand, insert expansion in the form of quotes is partly a "formal" component because it merely repeats prior messages to create a broader context for other elements of online talk.

The second research question focussed on the ways in which information is sought and shared dialogically within diverse patterns of asynchronous online talk structured by expanded adjacency pairs. To this end, four main patterns of online talk were scrutinized. The qualitative findings highlight the importance of post-expansion because information seeking and sharing merely occurring within unexpanded adjacency pair may remain at a general level. Naturally, a single answer may suffice in the case of a well-defined problem situation where a response offering a fact can meet the information need. Often, however, more detailed and nuanced answers can be obtained when the base FPP - SPP pair is substantiated by specifying or challenging prior responses or broadening the topic by introducing novel viewpoints to an issue at hand. The findings suggest that post expansion based on the specification of existing answers can result in the series of more detailed responses directly focussed on the initial question. Broadening the discussion topic can be a double-edged sword. It may help the participants to identify alternative ways to solve a problem but can also encourage them to introduce novel aspects detracting the discussion from the original issue. Finally, post-expansion based on the challenging of prior answers can detect incorrect or biased responses. On the other hand, the questioning of an answer can give rise to conflicting arguments which may detract the debate from the original topic.

Due to the high number of potential combinations of the categories constitutive of online talk, the present study is limited in that it only focussed on four ideal typical patterns. In general, such patterns are constructed to approximate reality by selecting and accentuating certain elements of phenomena being studied, for example, online talk incorporating information seeking and sharing. However, ideal typical patterns are not meant to correspond to all of the characteristics of any one particular case of online talk of this kind. For instance, the ideal typical pattern in which answers are specified by means of "pre- and insert expansions plus post-expansion" does not specify how domain-specific post-expansions are constructed while refining responses to questions dealing with car painting or installing a water pump. Instead, ideal typical patterns make it understandable how the participants of online discussion specify the answers by building on information available in pre-expansion (introduction of the topic) and insert expansions (prior answers).

Problems in using ideal typical patterns in CA include the risk of overlooking the connections between them, and the difficulty of showing how diverse types and their elements fit into online talk as a whole. The analysis of longer discussion threads with 20+ messages revealed that online talk is often constituted by varying combinations of such patterns. The discussion may be launched by base pair question - answer, followed by another FPP- SPP pair with post-expansions of various types. In novel adjacency pairs thus formed, attention may be devoted to the specification of an issue at hand from a more limited angle. Thereafter, the discussion may be continued in an additional adjacency pair in which the prior responses are challenged, resulting in a third adjacency pair in which the discussion is geared towards a related topic. The structure of the expanded adjacency pairs may further be complicated in that an initial FPP - SPP pair may be interrupted by an intervening question forming the FPP of a novel adjacency pair. Overall, the present study confirmed Herring´s (1999) notion about the existence of disrupted adjacency pairs. Unsurprisingly, particularly in longer threads, online talk is sometimes quite chaotic, especially if there are multiple questions giving rise to partly overlapping adjacency pairs. No wonder that the complexity created by the combinations of adjacency pairs with various modes of post-expansion tends to be the trouble source for the analyst. This is because messages specifying the answers, broadening the topic and challenging prior answers may appear within the same expanded adjacency pair initiated by a single question.

The evaluation of the novelty value of the empirical findings is rendered difficult due to the lack of similar studies. Many of the CA investigations conducted so far in the fields LIS, communication research and education science have focussed on synchronous conversation occurring in chat forums (e.g., Gibson, 2009b; Koshik and Okazawa, 2012; Smithson *et al*., 2011). In terms of CA, studies such as these are limited in that they do not address the issues of expansion, due to the marginal role of quotes in chat discussion.

Despite the lack of comparable investigations, the findings of the present study suggest that CA provides a sophisticated tool for micro-level analysis of asynchronous online talk relevant to information seeking and sharing. The main strength of CA is that the dialogue constitutive of information seeking and sharing can be scrutinized in detail by tracing how questions invite responses and how responses are constructed, refined, broadened and challenged in light of prior discussion. CA can also effectively detect the complexities of expanded adjacency pairs and reveal the convoluted nature of dialogical information seeking and sharing occurring in long discussion threads. However, the scrutiny of the transcripts of asynchronous discussion by means of CA is not without problems. Overall, CA is a time-consuming method which is best suited to the in-depth study of relatively short threads with concise messages. Conversely, CA is less applicable to the scrutiny of messages containing several text paragraphs. In this case, it may be reasonable to supplement CA with qualitative content analysis (Steensen, 2014). In the study of online talk, the latter method is helpful in the creation of an overview of the nature of discourse occurring in a forum, while CA can be used to specify the features of dialogue.

Conclusion

The present study contributed to research on dialogical information interaction by making use of the ideas of CA. The investigation also offered a methodological contribution to "digital CA" (Giles *et al*., 2015) by elaborating the tenets of traditional conversation analysis (Schegloff, 2007). The findings suggest that digital CA holds good promises as a method enabling micro-level analysis of asynchronous online talk, similar to spoken conversation examined by CA analysts since the 1970s. The findings indicate that dialogical information seeking and sharing is a complex phenomenon constituted by evolving combinations of questions and responses. Even though CA is a time-consuming method, it offers an effective tool to delve into the nuances of dialogical information interaction by examining the nature of post-expansions in particular. As the present investigation focused on a relatively low number of threads of an asynchronous discussion group focussed on

particular domain, that is, DIY projects, the findings cannot be generalized to concern online talk occurring in electronic platforms of diverse types. To refine the picture of online talk, additional research is required to compare the nature of dialogue in other domains of information seeking and sharing, as well as various fora of social media.

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